



2009 AIAA Passport to the Future Teacher Workshop

August 3-4, 2009
Denver, Colorado

Presentation Proposal Form

Workshop Goals:

- Motivate K-12 educators to use aerospace topics in their classroom to excite students and invigorate STEM education
- Provide meaningful, ready to use materials to assist the teach hit the ground running when school begins
- Inform educators on workforce development needs for aerospace engineering and technology needs

Presentations will be scheduled in 60 and **120 minute blocks**, with 2 sessions running concurrently. An LCD projector and screen will be provided, other AV or internet connection needs will need to be identified in advance by the presenter and charges may apply.

Presentations may be compiled in a workshop CD/DVD and may be posted on the AIAA Pre-College Outreach website for teachers to access following the workshop. Please fill in the form below and return to Lisa Bacon by e-mail at LisaB@aiaa.org or complete/print & fax to "Attn: Lisa Bacon" at 703-264-7551

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Title of Proposed Presentation: **MESSENGER - Welcome to the Solar System**

Presentation Description (max. 60 words - will be used in workshop promotion materials and program):

Learn how to incorporate NASA's MESSENGER Program materials into your classroom's study of the Solar System during this hands-on, collaborative, and interactive presentation. You will walk through the well planned units in MESSENGER noting how the format will help you deliver each lesson. You will learn why scientists use models and how models will help your students understand concepts.

Grade Level Focus: **K-8**

Aligned to which standards?

National Science Education Standards met during hands on activities:

Content Standard Unifying Concepts and Processes: Evidence, models, and explanation (K-12)

Models are tentative schemes or structures that correspond to real objects, events, or classes of events, and

that have explanatory power. Models help scientists and engineers understand how things work. Models take many forms, including physical objects, plans, mental constructs, mathematical equations, and computer simulations.

Standard A2: Science as Inquiry: Understanding about scientific inquiry (K-4)

Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects, events, and organisms; classifying them; and doing fair test (experimenting).

Standard A2: Science as Inquiry: Understanding about scientific inquiry (5-8)

Different kinds of question suggest different kinds of scientific investigations. Some investigations involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve seeking more information; some involve discovery of new objects and phenomena; and some involve making models.

Standard A2: Science as Inquiry: Understanding about scientific inquiry (5-8)

Scientific explanations emphasize evidence, have logically consistent arguments, and use scientific principles, models, and theories. The scientific community accepts and uses such explanations until displaced by better scientific ones. When such displacement occurs, science advances.

Standard A2: Science as Inquiry: Understanding about scientific inquiry (5-8)

Scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures for an investigation, or develop new technologies to improve the collection of data. All of these results can lead to new investigations.

Standard B1: Physical Science: Properties of objects and materials (K-4)

Matter can exist in different states—solid, liquid, and gas. Some common materials, such as water, can be changed from one state to another by heating or cooling.

Standard B3: Physical Science: Light, Heat, Electricity, and Magnetism (K-4)

Light travels in a straight line until it strikes an object. Light can be reflected by a mirror, refracted by a lens, or absorbed by the object.

Standard D1: Earth and Space Science: Structure of the Earth System (5-8)

Land forms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediments, while destructive forces include weathering and erosion.

Standard D2: Earth and Space Science: Objects in the Sky (K-4)

The Sun provides the light and heat necessary to maintain the temperature of the Earth.

Standard D2: Earth and Space Science: Earth's History (5-8)

The earth processes we see today, including erosion, movement of lithospheric plates and changes in atmospheric composition, are similar to those that occurred in the past. Earth history is also influenced by occasional catastrophes, such as the impact of an asteroid or comet.

Standard D3: Earth and Space Science: Earth in the solar system (5-8)

The earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, and smaller objects, such as asteroids and comets. The sun, an average star, is the central and largest body in the solar system.

Briefly describe any interactive activities in presentation?

Teachers will walk through the various components that compose the well planned units in MESSENGER noting how the format will help them deliver each lesson. The teachers will learn why scientists use models and how models will help their students understand concepts. They will choose foods to represent the planets then learn how to create a scale model of the Solar System by pacing out the planets' locations. Teachers will

observe a demonstration of how to have students use flour as a planetary surface material to model impact craters. They will participate by using their hands to form a hydrogen model, and then they use their head and two hands to form a water molecule. They will learn kinesthetically that the angle of the hydrogen molecules changes when it freezes. The teachers will participate in a hand-on inquiry activity using a detection tool that changes color when exposed to UV light. The teachers will walk through a lesson that asks students to create a plan for a spacecraft exploration of another world.

What will teachers take home from your presentation?

The teachers will take home a better understanding of how to teach space science using models and inquiry. They will be provided with access to six well planned, up to date (NASA is still writing some of the modules) units filed with fun, hands-on, thought provoking activities, well organized lesson plans, and ample background material to easily implement the lessons. All of the units are currently available at www.sharonfreeburn.com/messenger.html .

Will you be bringing a laptop for your presentation? ☒ Yes ☐ No

This is a TWO HOUR workshop.

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